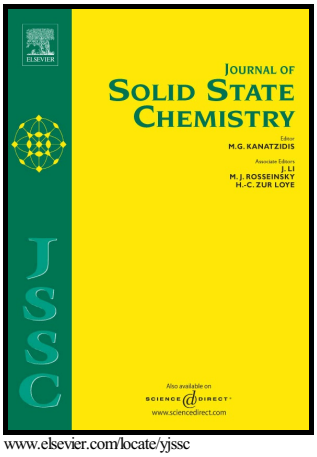

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Abstract

Three microporous Zn coordination polymers, $[Zn_3(OH)_2(TCBA)(4,4'\text{-bpy})]\cdot 5.5H_2O$ (**1**), $[Zn_3(OH)_2(TCBA)(4,4'\text{-bpy})_{1.5}]\cdot 5H_2O$ (**2**), and $[Zn_4(TCBA)_2(4,4'\text{-bpy})_2(H_2O)_8]\cdot 11H_2O$ (**3**) (H_4TCBA = 3,4,5-tris(carboxymethoxy)benzoic acid, 4,4′-bpy = 4,4′-bipyrdine), have been hydrothermally synthesized and structurally characterized. **1** presents an uncommon 2-nodal (4,10)-connected network with $\{3\cdot 4^5\}_2\{3^4\cdot 4^{12}\cdot 5^{10}\cdot 6^{14}\cdot 7^3\cdot 8^2\}$ topology; **2** can be described as a 2-nodal (3,8)-connected **tfz-d** net with the symbol of $\{4^3\}_2\{4^6\cdot 6^{18}\cdot 8^4\}$, both networks are constructed from hexameric $[Zn_6(\mu_3\text{-}OH)_4]^{8+}$ clusters. While **3** shows an interesting 4-nodal (3,3,3,4)-connected network with $\{8\cdot 10\cdot 12\}_2\{8\cdot 10^2\}_2\{8^4\cdot 10\cdot 12\}$ topology. Complexes **1–3** all own 3-D frameworks with 1-D channels, and in **1–3** lattice and/or coordinated water molecules occupy the channels, especially in **3** Zn-bipy chains reside in the channels together with water molecules. Double helical chains can be observed in complex **2**; and single helix chains exist in complexes **1** and **3**. Furthermore, the thermal stabilities and photophysical properties of complexes **1–3** were also investigated.